PRESS BULLETIN 471 *January, 1935*

UNIVERSITY OF FLORIDA
AGRICULTURAL EXPERIMENT STATION
WILMON NEWELL, Director
GAINESVILLE, FLORIDA

IMPERIAL BUREAU
2 MAY 1935
INSTITUTE

COMMERCIAL CONTROL OF WATERMELON ANTHRACNOSE*

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Anthracnose is the most important disease of watermelons in most localities of Florida. The extent of damage varies with weather conditions. Consequently, losses are much heavier in some years than in others. Weather conditions in 1934 were unfavorable for watermelons and favorable for development of their various diseases, particularly anthracnose. As a result, the yield and quality of melons were very low in many sections of the State. Anthracnose appeared in the fields earlier in the season than usual and attained an epidemic stage as the season progressed. It was apparent that in some fields damage was greatly increased through a lack of understanding on the part of the growers of certain fundamental facts concerning the disease. To combat anthracnose successfully a thorough knowledge of certain of its characteristics and conditions favoring its development is essential. Since the disease occurs to some extent every year, control measures should be considered as a matter of insurance and applied every year.

Anthracnose is caused by a fungus, which begins its cycle as spores left on the seed at the time of their extraction from melons the previous year. These spores stick to the watermelon seed and are planted in the field along with the seed. When the seed germinates, the fungus spores also germinate and attack the small plants. This phase of the development of anthracnose is never observed by the grower, as the disease is not conspicuous at this time and there may be only a few such infected plants in the field.

As the watermelon plants continue their growth, the fungus also grows and in turn produces new spores which are capable of infecting other plants. The spores of the anthracnose fungus are spread almost altogether by water. Rain splashing or running from a diseased plant carries the spores to healthy plants. A frequent agent of spread is the grower himself, who in walking among vines wet with dew or rain carries the spores to healthy plants. It thus happens that by the time heavy rains start there are several centers of infection of from one to several plants scattered over the field. From these centers of infection the disease spreads rapidly in all directions as soon as conditions become favorable and causes the killing of leaves and runners. This stage of the disease is too well-known to require detailed description.

One of the most frequent means of rapid dissemination of anthracnose after the centers of infection are well established is the practice of thinning, or "pruning" as it is usually called. This operation consists of workmen walking through the vines carrying sticks with which they brush the leaves aside to find the melons to be removed. When the vines are wet it would be difficult to find a more satisfactory method for distributing the anthracnose disease. The same applies during the picking season. If the melons

* More detailed information on this and other diseases of watermelons is given in Florida Station Bulletin 225.

are picked while the vines are wet, it is a common experience to find that shortly after the first picking anthracnose sweeps through the field in such a manner as to be called the "June frost". When this rapid spread of the disease occurs, the grower then resorts to dusting in the hope that the disease can be checked. When the disease has reached this stage, however, dusting very seldom proves to be anything but a waste of money. This is particularly true because very few field hands can be depended upon to spray or dust the vines thoroughly. Oftentimes a bluish-white path about one foot wide can be observed down the row where the workman has "dusted", or the center of a hill where the damage is already done is found to be caked with enough copper-lime dust to cover the entire vine properly.

PREVENTIVE MEASURES

In the first place, it should be understood that perfect control is very seldom obtained, and that all spraying and dusting are preventives rather than cures. The purpose and intent of the grower must be to delay the appearance of anthracnose and to impede its spread so as to prevent its getting sufficient start to kill all of the plants in the field before the melons are ripe, and to do this at the least possible cost. The employment of methods to prevent the occurrence of disease on young plants is always cheaper and more effective than any steps taken to check the disease on old plants.

The most vulnerable point of attack is the spores of the anthracnose fungus on the seed. All seed should be treated before planting with 1:1,000 solution of bichloride of mercury to kill all spores on the surface of the seed. The seed should be soaked from five to 10 minutes in solution, and then rinsed thoroughly in running water, or through several changes of water where running water is not available. They should then be spread out to dry in some shaded place. There is some evidence that a dust treatment such as one of the organic mercury compounds may be just as effective as the liquid treatment.

The next step in the campaign against anthracnose is the dusting of the young plants to prevent the development of primary infection centers from which the rapid spread of the disease occurs later in the season. Two or three dustings or sprayings early in the season are less expensive and more effective than heavy applications late in the season after the disease has already become prevalent. A 20-80 copper-lime dust or a 4-4-50 bordeaux spray may be used for these treatments. The plants should receive the first treatment just as they begin to form vines, and at intervals of a week or 10 days thereafter. The exact number of applications will depend on the weather conditions. An effort should be made to keep the vines covered with the fungicide, and should rains be frequent and heavy at this time a greater number of applications will be necessary. Under ordinary conditions three applications are ample. Care should be taken to cover the plants thoroughly with a thin, uniform covering of the fungicide to kill the spores of the fungus as they germinate. After the fungus has once gained entrance to the plant the spray or dust will not reach it and therefore will not check development of the spots. When the disease has appeared in the field in abundance, it is too late to combat it successfully.

In work at Leesburg the use of a metal funnel at the end of the discharge pipe of the duster has been found helpful in dusting young vines, as a better coverage is obtained and wind interference is lessened. Such a funnel or bell is described in Florida Experiment Station Bulletin 252.

The next thing is to prevent the rapid spread of the disease by workmen walking through the wet vines. A certain amount of this may be necessary, but there is no question that too little attention is paid by growers to this important means of cutting down on the injury done by anthracnose. Next to the treatment of the seed, this is the most important measure that can be taken by growers in combating anthracnose.

Occasionally where the disease has already become severe, a dusting to prevent lesions on the melons may be advisable, but if proper measures have been taken earlier to control the disease, there will be no cause for worry about the melons themselves.